

Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

AFRICA.—*Capello and Ivens' Journey.*—Messrs. Capello and Ivens reached Lisbon on Sept. 17th, after traveling 4200 geographical miles in Africa during fifteen months. From the Portuguese territory they proceeded towards the Cubango, as far as the lower part of the Tucussu, where the barrenness of the region, intersected by water-courses and marshes, forced them to turn northwards through a district infested by the tsetse. Sixteen of the party died of tsetse-bites, besides cattle and dogs. Sixty-two men perished during the fifteen months. The principal results of this journey are the rectification of the course of the Cunene, the determination of the Quarrai and its union with the Cubango, as well as the interesting hydrography of the Handa and the Upper Ovampe; the exploration of the Cubango between 15° and 17° S. lat., and of its principal eastern affluents; the investigation of the basin of the Upper Zambezi to Libonta, and the upper and middle course of the Cabompo; the discovery of the Cambai, an eastern branch of the Upper Zambezi; the exploration of the sources of the Lualaba and Luapula, and of the northern tributaries of the Middle Zambezi; and the identification of the Lœngue with the Kafuke. The great lake Bangweolo of modern maps is really composed of two smaller lakes, Bangweolo to the north, and Bemba to the south, separated by a marshy belt. This agrees with M. Giraud's account.

GEOLOGY AND PALÆONTOLOGY.

THE STERNUM OF THE DINOSAURIA.—The discussion which has been going on between palæontologists, as to the nature of the sternum of the Dinosauria, and the presence or absence of clavicles in this order, induces me to present some evidence which bears distinctly on the question. The first point to be noticed is the pair of bones represented in Fig. 1, which belongs to the skeleton of *Diclonius mirabilis* Leidy.[1] It is evident that these resemble very nearly the parts discovered by Dollo in the *Iguanodon bernissartensis*, in place, and referred by him to the sternum.[2] Not having been present at the exhumation of the Diclonius, I cannot give their exact relations. The positions in which the bones were found by Dollo in the Iguanodon renders it highly probable that they are the separate pleurosteal elements of the sternum. The long processes will then be posterior, and will have given attachment to ribs. Such a type of sternum is, however, unique, and requires good evidence before admission into our descriptions.

Important evidence on this point is furnished by the probable corresponding element in the Laramie dinosaurian, the *Monoclonius crassus* Cope.[3] This is a quadrupedal form, about as large

[1] Proceedings Academy, Philadelphia, 1883, p. 97.

[2] Bulletin du Musée Royal d'Histoire Naturelle de Belgique, 1882, p. 208.

[3] Proceedings Academy, Philadelphia, 1876, October; Pal. Bulletin, No. 22, p. 8.

as a *Rhinocerus unicornis*, with teeth approaching those of Hadrosaurus in characters. The accompanying figure 2 represents the element in question, one-tenth the natural size. Here the lateral elements are united on the middle line, which projects as an obtuse keel. The lateral processes are nearly transverse, and are impressed at their extremities by articular surfaces. The opposite extremity presents a facet on each side for a squamosal articulation with a flat bone (*c*, Fig. 2), in which the inferior bounding ridge projects much further than the superior one. This articulation cannot be for any other bone than the coracoid, and it resembles considerably the corresponding groove on the sternum of the crocodile. The general surface of the bone is dense, and does not resemble the imperfect ossification described by Hulke in the bone of similar character referred by him to

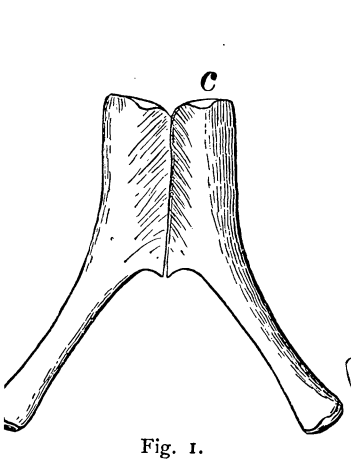


Fig. 1.

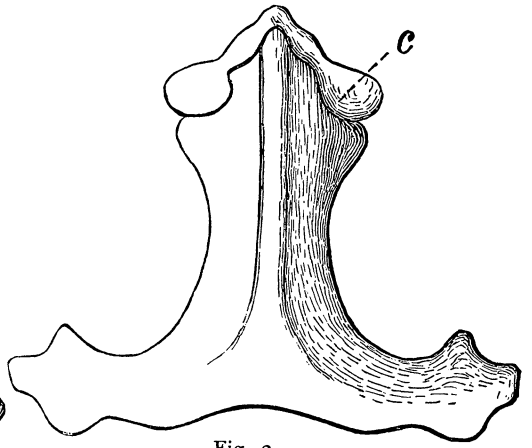


Fig. 2.

FIG. 1, Sternum of *Diclonius mirabilis* Leidy; FIG. 2, do. of *Monoclonius crassus* Cope; both one-tenth natural size; *c*, coracoid facet. From the Laramie beds of Dakota and Montana.

Iguanodon.[1] That the element in Monoclonius, represented in Fig. 2, is the sternum, seems very probable, and, if so, the elements in Diclonius (Fig. 1) are sternum also.

The T-shaped bone figured by Hulke, if inverted, would resemble the elements here referred to the sternum in Diclonius and Monoclonius. Mr. Hulke describes a probable articular facet along its sides "posterior" (anterior) to the divergent bars, as suggesting an articulation with an epicoracoid. This may correspond with the facet *c* in Diclonius and Monoclonius, which, I suppose, received the edge of the coracoid. This justifies the proposition of Baur,[2] that this bone should be inverted, and that the supposed clavicles of Hulke and Marsh are posterior pro-

[1] Quarterly Journal Geological Society, 1885, pl. XIV.
[2] Zoologischer Anzeiger, No. 205, 1885, p. 2.

cesses of the sternum and not anterior. The evidence for this position rests primarily, I repeat, on the position of the bones observed by Dollo, and the character of the corresponding element in Monoclonius.

But it may be that the bone figured by Hulke is a different element from that figured by Dollo, as supposed by the latter.[1]

The proximal end of the scapula of *Diclonius mirabilis* resembles very much that which I have figured and described as belonging to *Hadrosaurus foulkei*,[2] excepting that it possesses a strong tuberosity on the anterior border (*spina scapulæ*), which is wanting in that species. It is represented as weak in the two species of Iguanodon by Dollo, and as rather strong in the same genus by Hulke.—*E. D. Cope.*

Corrections of Notes on Dinocerata.—In the Naturalist for June, 1885, I gave a synopsis of the genera of this suborder, which was partly based on new information derived from Professor Marsh's work, then recently published. Among them was included the supposed genus Tetheopsis, whose character consisted in the absence of inferior canine and incisor teeth. The discovery of species presenting such a peculiarity would not be at all surprising in view of the reduction which the roots of these teeth display in some of the species, and the absence of superior incisors in all of them. The character on which the genus was predicated is figured by Professor Marsh in the skull referred to *Tinoceras stenops* Marsh, without comment in the description which follows. I now learn on good authority that the symphyseal region in the specimen in question is entirely constructed of plaster of Paris. I saw the specimen, and a rather close examination did not reveal the line of separation between the plaster and the bone, which it is colored to imitate, and which is not indicated in either Professor Marsh's figures or description. The genus Tetheopsis must then be regarded as an artifact!

I add that the basal part of a skull which I described under the head of *Uintatherium lacustre* Marsh (U. S. Geological Survey, Terrs., III, p. 592) turns out to belong to a Palæosyops. The skull was found in a broken condition mingled with loose fragments and teeth of the Uintatherium in such a way as to lead to the belief that they belonged together.—*E. D. Cope.*

Discovery of lamellate thoracic Feet in the Phyllocarida.—In a genus of Phyllocarida, allied to Ceratiocaris, which is represented by a specimen from the Carboniferous beds of Mazon creek, Illinois, kindly loaned me by Mr. J. C. Carr, of Morris, Ill., there are plain indications of broad lamellate feet like the thoracic feet of Nebalia.

Of these limbs there are traces of four pairs. They are broad

[1] Revue des Questions Scientifiques, 1885, p. 8, top.
[2] Transactions American Philosophical Society, 1869, XIV, p. 92.

and thin, slightly contracted in width near the base, and at the distal extremity quite regularly rounded, with the free ends apparently slightly folded longitudinally, the edges appearing to be slightly crenulated, though the folds were perhaps due to changes after death. All the feet are of nearly the same size, and are about two-thirds as long as the carapace is high, being of nearly the same proportionate length as in Nebalia. There are no traces of a division into endopodites and exopodites, but we should be inclined to regard the parts preserved as the homologues of the exopodites of Nebalia.

This specimen, then, indicates the existence in extinct Phyllocarida of thin, broad, lamellate, thoracic limbs, in general appearance like those existing in Nebalia, and should this view be substantiated by farther discoveries it will prove the reasonableness of uniting Ceratiocaris and its allies with the modern Nebalia. I had a year ago considered this form as new and gave it a MS. name *Cryptozoë problematicas*, as I was in doubt as to its affinities; but lately submitting it to Mr. C. E. Beecher, with the opinion that it was a Ceratiocaris, he writes me that he regards it as new to science. A description of the new genus and species, with figures, will appear hereafter.—*A. S. Packard.*

Geological Survey of Pennsylvania.—Report of Progress x contains a geological hand-atlas of the sixty-seven counties of Pennsylvania, and is the work of J. P. Lesley, the chief of the survey. The volume is one which ought to be in the hands of every one interested in field geology, embodying as it does, in convenient form, the entire results of the survey, so far as they can be cartographically represented. The maps are prefaced by an explanation of the geological structure of Pennsylvania, and a short account of the characteristic features of each county.

Geological Survey of Minnesota.—Professor Winchell's Twelfth Annual Report commences with a summary statement of work done. From this it appears that maps of thirty-two counties are completed, and several others in course of preparation. A new trilobite of the genus Bathyurus is described. Professor Winchell gives an account of experiments with cubes of New England and Minnesota granites, and seems to prove the latter to be the stronger.

C. L. Herrick contributes a final report on the Crustacea of Minnesota (Cladocera and Copepoda). This occupies 191 pages, includes an account of the enemies of entomostræa, and appears to be exhaustive. It is illustrated with numerous plates. The volume concludes with a catalogue of the flora, by Warren Upham. It includes 1650 species, comprising vascular cryptogams, but not fungi or algæ.

Geological News.—*General.*—A. S. Woodward (*Geol. Mag.*, Nov., 1885) gives a list of the British fossil Crocodilia. One spe-

cies occurs in the Upper Trias, six in the Upper Lias, thirty-nine from the other Jurassic beds, eleven from the Purbeck and Wealden beds, three from the green sand, and six from the Eocene.

Silurian.—Dr. O. Hermann (*Geol. Mag.* Sept., Oct., 1885) gives an account of the organization of the Graptolithidæ. The entire polypidom proceeds from a simple hollow cone called the *sicula.* In the external wall of this dagger-shaped organ a single or double solid axis is developed. Thus, until the sicula is found, it is impossible to tell whether any given form belongs to the monograptidæ or to a two-branched family. Sprouting does not always commence at the same spot of the sicula. It is now assumed that all graptolites provided with a sicula were not attached bodies, the character of the termination, and its disappearance in full-grown individuals, militating against attachment. In some of the much-branched Dichograptidæ a central chitinous disc unites the basal part of the branches. It has been ascertained by Hopkinson that in some graptolites the hydrothecæ were separated from the cœnosarc by a well-marked septum, and that the cœnosarc was divided by septa into transverse joints. The oldest graptolite, according to Brogger and Hermann, is *Dictyograpius teneilus;* and the family Dichograptidæ, which includes complicated and elegant forms of graptolites, is older than the universal groups. This family appears in the Lower Silurian (Waring), becoming extinguished before the Upper Silurian is reached. The Phyllograptidæ and Lasiograptidæ seem to be confined to the lowest division of the Lower Silurian, the Leptograptidæ and Dicranograptidæ to the Lower Silurian, while the Diptograptidæ and Retiohtes commence in the lowest Lower Silurian, but are most developed at its upper boundary, and extend into the Upper Silurian. The simplest family, the Monograptidæ, are, according to Lapworth, strictly confined to the Upper Silurian. The genus Dictyograptus, of which Tullberg makes a new family (though Hermann ranges it with the Dichograptidæ), maintains itself through the entire Silurian, and passes into the Devonian.

Devonian.—Professor Williams has described (*Geol. Mag.*,Sept., 1885), *Prestwichia eriensis*, a new Limuloid from the Devonian of Le Bouf, Erie county, Pa.

Cretaceous.—The new facts regarding the fossil flora of the western Northwest Territory of the Dominion of Canada require the intercalations of three distinct plant horizons not previously recognized. One of these, the Kontame series, probably belongs to the Urgonian or Neocomian, or is at least not newer than the Shasta group. It seems to correspond to the oldest Cretaceous flora of Europe and Asia, and to that of the Korné formations in Greenland. The second or Mill creek series corresponds closely to the Dakota, and seems to represent the flora of the Cenoma-

nian and Turonian divisions of Europe. The third sub-flora is that of the Belly river at the base of the Fort Pierre group. Though separated from the Laramie by the Pierre and Fox hill groups, it introduces the Laramie or Dominion flora, which continues to the top of the Cretaceous, and probably into the Eocene, and includes several species still surviving in America. Next comes the Laramie group itself, the fossils of which are found in Canada, chiefly in the lower and upper beds, the middle beds being poor in plants. Sir W. Dawson concludes that no cause for the mild temperature of the Cretaceous other than change of elevation need be invoked.

Tertiary.—According to Woodward, fifteen species of fossil sirenians have been referred to Halitherium, while two considerably larger species, both found in Italy, are placed in Felsinotherium, and closely resemble Halicore in dentition. *Prorastomus sirenoides* Owen, from Jamaica, differs widely from all other sirenians, but is nearer Manatus than Halicore. The dental formula is $i\,\frac{3-3}{3\,3}$ c. $\frac{1-1}{1-1}$ p. m. $\frac{5-5}{5-5}$ m. $\frac{3\,3}{3\,3} = 48$. Felsinotherium has $i\,\frac{1\,1}{0\,0}$ m. $\frac{5-5}{5-5}$. An interesting discovery was a cast of the interior of the skull of *Eotherium ægyptiacum* at Mokattam, near Cairo, in 1875. The brain of the huge Rhytina is only one-sixth of the size of that of the manatee or dugong. The total number of extinct sirenians enumerated by Woodward, including Chirotherium from Piedmont; Chronozoön from New South Wales; Crassitherium from Belgium; Dioplotherium and Hemicaulodon from South Carolina and New Jersey; Pachyacanthus from near Vienna; Rhytiodus and Trachytherium from France, and two extinct Manati, is twenty-eight. The recent species are three of Manatus and three of Halicore. Dr. Murie believes that the large number of fossil species described will probably have to be reduced into two or three genera.

MINERALOGY AND PETROGRAPHY.[1]

Etched Figures. — Under this general head are included etched figures proper (Aetz-Figuren of the Germans) and figures produced by weathering (Verwitterungs-Figuren). These were first studied, as early as 1816, by Daniell.[2] A little later, Leydolt[3] investigated the forms of the depressions on rough surfaces of crystals. Pape[4] next took up the subject. He drove off the water contained in many minerals and examined the shape of the figures resulting (Verstäubungs-Figuren). In later years, many other investigators have attempted to discover the relations between etched figures, those produced by weathering and the directions of cohesion in minerals. Baumhauer succeeded in proving that the shapes of etched figures were independent of the

[1] Edited by W. S. Bayley, Johns Hopkins University, Baltimore, Md.
[2] Quart. Jour. Sci., 1, 1816, p. 24.
[3] Sitz.-Ber. der Akad., Wien, 1855, 15, p. 59.
[4] Poggendorf's Annalen, 124, p. 329, etc.